

IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A method of position determination in a radio system, the method comprising the acts of:

    multiplying a signal received by a multiplier with a carrier signal from a carrier generator to form a mixed down signal;

    correlating the mixed down signal with a replica signal from a code generator to form a correlated signal;

    processing the correlated signal with an optimization function comprising an exponential term in combination with a second term to form an output signal that provides a position measurement in indoor environments with multiple diffuse reflections; and

    feeding back the output signal to control the carrier generator and the code generator for improving accuracy of the position measurement;

wherein the exponential term is in the form  $Be^{-at}$  and the second term is of the form:

$$\frac{r_0}{t_2} \sqrt{1 - \frac{r_0^2}{t_2^2}}.$$

Claims 2-4 (Canceled)

5. (Previously Presented) The method according to claim 1, further comprising the act of fitting the optimization function and a Line-of Sight correlation function with a set of parameters.

Claim 6 (Canceled)

7. (Previously Presented) The method according to claim 1 comprising first operating a multipath mitigation technique to effect correlation of the received and replica signals.

8. (Previously Presented) The method according to claim 7, wherein the multipath mitigation technique comprises a Multipath Estimating Delay Locks Loop technique.

9. (Previously Presented) The method according to claim 7, wherein the multipath mitigation technique comprises a Minimum Mean Square Error technique.

10. (Previously Presented) A computer program product directly loadable into the internal memory of a digital computer, comprising software code portions for performing the method of claim 1 when said product is run on a computer.

11. (Previously Presented) A computer program directly loadable into the internal memory of a digital computer, comprising software code portions for performing the method of claim 1 when said program is run on a computer.

Claims 12-13 (Canceled)

14. (Currently Amended) An apparatus for position determination of a radio system, the apparatus comprising:  
a carrier generator for providing a carrier signal;

a multiplier for multiplying a received signal with the carrier signal to form a mixed down signal;

means to correlate the mixed down signal with a replica signal and form a correlated signal;

a code generator to provide the replica signal; and

means to process the correlated signal with an optimization function comprising an exponential term in combination with a second term to form an output signal that provides a position measurement in indoor environments with multiple diffuse reflections;

wherein the output signal is fed back to control the carrier generator and the code generator for improving accuracy of the position measurement;

wherein the exponential term is in the form  $Be^{-\alpha t}$  and the second term is of the form:

$$\tau_0 \sqrt{1 - \frac{\tau_0^2}{t_2}}.$$

Claims 15-17 (Canceled)

18. (Previously Presented) The apparatus according to claim 14, further comprising means to fit the optimization function and a Line-of Sight correlation function with a set of parameters.

Claim 19 (Canceled)

20. (Previously Presented) The apparatus according to claim 14, further comprising means to first operate a multipath mitigation technique to effect correlation of the received and replica signals.

21. (Previously Presented) The apparatus according to claim 20, wherein the multipath mitigation technique comprises a Multipath Estimating Delay Locks Loop technique.

22. (Previously Presented) The apparatus according to claim 20, wherein the multipath mitigation technique comprises a Minimum Mean Square Error technique.